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Urachal Cyst simulating Appendicular Abscess: Arrested Development of Genital Tract; with Notes on Recently Reported Cases of Urachal Cysts

BY

ALBAN DORAN, F.R.C.S.

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1909

in my opinion it is impossible for a tracheal cyst to become free from the peritoneum

With kindest regards

yours sincy

A Keith.

Telegraphic Address "SPLINTS, LONDON"
Telephone 4693 HOLBORN.

Royal College of Surgeons of England.
Lincoln's Inn Fields.
London. W.C.

30th day of Sept. 1908

Dear Dr Doran,

I have never seen the trachea with a free mesentery in the newly born but I have on several occasions seen a very considerable mesentery in the adult. But in such bodies the obliterated hypogastric arteries had even deeper & better marked mesenteries.

I am very much interested in such cases as you mention but can give no help except that

DR. LOGAN CLENDENING
404 BRYANT BUILDING
KANSAS CITY, MO.

June 11, 1909

Dear Sir -

Your very kind and gratifying letter I have just received. It is a source of great satisfaction to me to have been able to do anything which brought me your cordial praise and allowed me the privilege of feeling a personal acquaintance with you. You may be sure that if the rather tedious process of examining a series of cadavers and foetuses which I am now undertaking is productive of anything interesting concerning the machine, I will send you the results as your very kind words will have been entirely instrumental in starting the research. I thank you for the reprint which I await, and I hope I may have the privilege of calling upon you when I visit London in the near future.

Very truly Yrs
Logan Clendening

November 20th, 1925.

My dear Colleague,

I am much obliged to you for kindly sending me the reprint of your important paper on "Tuberculosis of the Urachus" which arrived safely on November 27th.

You will find an abstract of your monograph in the British Medical Journal for November 20th, Epitome, paragraph

147. I am glad that so reliable an authority as Dr. Cullen is about to publish a work on "Diseases of the Umbilicus".

I remain,

Yours very truly,

William Dawson

Dr. J. Rilus Eastman,
Indiana State Medical Association,
Indianapolis, Ind.
U.S.A.

Urachal Cyst simulating Appendicular Abscess: Arrested Development of Genital Tract; with Notes on Recently Reported Cases of Urachal Cysts.

By Alban Doran, F.R.C.S.

Over ten years ago I read before a meeting of the Royal Medical and Chirurgical Society a communication entitled "A Case of Cyst of the Urachus with Notes on Urachal and so-called 'Allantoic Cysts.'" Several years passed by, but I came across no further examples of urachal cyst in my own practice until last summer, when I revealed by operation a remarkable and, I must add, undiagnosed example of this form of tumour. It simulated appendicular abscess, and was associated with arrested development of the upper part of the genital tract. I will relate this case and then dwell upon others recently reported by Mériel, Weiser, Binnie, Delore and Cotte, E. D. Ferguson, &c., adding an unpublished report of a cystic sarcoma of the urachus in the practice of my friend Mr. F. S. Eve. I shall discuss almost exclusively pure urachal cysts as distinguished not only from tumours which are not urachal but also from cystic urachal fistula, which, like other forms of urachal fistula, is clinically and surgically quite different from urachal cyst. The consideration of the pure cyst, in itself somewhat complicated, is quite sufficient for a single paper. I will endeavour to explain how much has been added to our knowledge of these cysts since I reported my first case in 1898.

The Case.

F. C., aged 17½, single, a dressmaker's apprentice, applied to Dr. Drummond Maxwell at the Out-Patients' Department, Samaritan Free Hospital, on July 16, 1908. She complained of tenderness and swelling in the right iliac fossa, associated with a history of a sudden attack of pain in that region a month previously, and she was admitted into my wards at once. After admission I found that the relations of the swelling to adjacent organs could not well be defined until I examined the patient with the aid of anæsthetics under circumstances presently to be explained.

The patient's mother informed me that the catamenia were established at the age of 14, without pain or constitutional disturbance. The periods were always scanty and attended with very little pain, and the interval was about five weeks. The patient had never suffered from any neurosis before, at, or after puberty.

On June 16, one calendar month before admission, the menstrual flow appeared as usual, but was accompanied by violent pain never experienced before. The pain continued for two days and then abated. The patient at once resumed her work as a dressmaker, but the pain returned two days later and obliged her to take to her bed again. During the whole of the week before admission she was quite incapable of attending to her duties.

Roughly speaking, as regards what could be made out before anæsthesia was employed, there was a fairly well-defined, almost spherical, swelling in the right iliac fossa, slightly movable and tender to touch. There was resonance on percussion over its outer aspect. The lower part of the swelling could be defined on rectal examination. I refrained from making a vaginal exploration until a consultation was held. Then it was found that the vagina was barely two inches deep. A kind of dimple could be felt at the blind extremity towards the right. The tumour did not bulge into the vagina. At the lower limits of the swelling was a tuberosity which lay behind the vagina and in front of the rectum. The temperature and pulse were low. The patient had never been laid up with any severe illness. Before the arrested development of the vagina had been detected, appendicular abscess was suspected, but after the examination hæmatometra or hæmatosalpinx seemed equally probable.

On July 21 the period began, as usual, about five weeks after that

which preceded it. I found that there was no palpable increase of pain or tenderness in the tumour nor any appreciable increase or decrease in size. The show was unusually free. I decided to examine the patient under anæsthesia during the period in order to discover the channel which transmitted the menstrual blood into the vagina, and for other manifest reasons.

Examination under Anæsthesia.

The patient was a fairly healthy but slightly anæmic blonde. Her manner and appearance were perfectly feminine. Though hardly over 5 ft. in height she was well proportioned, broader at the hips than at the shoulders, and free from hair on the face. The breasts were well developed; there was no areola round the nipples. The axillary and pubic hair corresponded to the patient's age. The inguinal canals contained no tender body. The perineum was markedly deep, so that the anterior commissure lay far forward. The labia, clitoris and meatus urinarius were normally developed. There appeared, on the other hand, to be no hymen, nor was there the least trace of carunculæ. The vagina formed a blind pouch about 2 in. deep; the rugæ were prominent. The vaginal pouch was distinctly deeper on the right side, whence dark menstrual blood was seen to issue. On stretching the adjacent mucosa with the fingers a crescentic fold with the concavity towards the left was detected. It covered the aperture whence proceeded the blood. A uterine sound could be passed into this aperture and pushed onwards for 3 in. upwards, backwards and a little to the right, closely following the outer limits of the lower pole of the swelling, as could easily be defined on digital exploration from the rectum (fig. 1).

On bimanual palpation the swelling was found to be a well-circumscribed tumour, firm, oval and as tense as a recent hæmatocele. It could be pushed a little downwards, yet even then its lower pole did not bulge into the vagina, but passed behind it. The tuberosity in the recto-vaginal septum, discovered at the previous examination, lay to the left of the menstruating tract. It felt like a small cervix.

The nature of the case remained obscure. I kept the patient at rest for a week. The period ceased and the tumour remained stationary. There was one sharp attack of local pain on July 28, without any rise of pulse or temperature.

Operation.

On July 29 I operated with the assistance of Dr. V. Monckton, Dr. Belfrage administering ether and chloroform. I made an incision in the middle line. The parietes were unusually vascular. After separating the recti I came across a thick membrane of doubtful character, and lower down I exposed the wall of the bladder which extended for quite 2 in. above the pubes. The membrane was cut through, and about half a pint of a perfectly clear fluid was removed; unfortunately none was preserved. The fluid lay in a cyst behind the recti and anterior to the parietal peritoneum, the membrane through which I had made the incision being the anterior portion of the cyst-wall. The cyst was connected with the bladder by a thick cord ½ in. in length. The upper limits of the cyst lay close below the umbilicus. In exploring the upper end of the tumour I laid open the peritoneal cavity. The omentum adhered to the peritoneum investing the back of the cyst. The intestines seemed healthy; there was no evidence of tuberculous disease, no free fluid, and no intraperitoneal tumour. Below the omentum some coils of ileum adhered to the parietal peritoneum behind the tumour.

I endeavoured to define the relations of the cyst to the genito-urinary tract. A catheter was passed into the bladder, and a few ounces of urine were drawn off. There was no communication between the cavity of the bladder and the cavity of the cyst; the thick cord between the two was clearly a portion of the urachus, and I observed that it ran into and not over the cyst-wall.

As might have been suspected from what could be defined before the operation, the cyst lay to the right of the middle line. On pressing against its wall on the right inferiorly, from the inner side, I detected a fusiform body like a uterine cornu, or a small but entire virgin uterus, lying in the position of the menstruating tract along which a sound had been passed a week before. Above this body thickened tissue could be felt, apparently a small ovary. The tuberous, cervix-like body already mentioned could be plainly defined through the walls of the lowest part of the cyst. When thus explored it was found to be a distinct, fairly movable structure, the left ovary or uterine cornu. On farther palpation through the cyst-wall the pelvic cavity felt quite free from any tumour or deposit. There certainly was no such thing as a collection of retained menstrual blood.

At this stage of the operation it became evident that the swelling,

"A note on Vesical Transduction in the Absence of the Body of the Uterus" By Alex. Brown
Lancet, May 22, 1909, p. 1456.

TELEPHONE,
2307 NORTH.

1, BARTHOLOMEW ROAD. N.W.

27th May 09.

Dear Sir

I am very much obliged to you for sending me your monograph. I shall be interested and I beg to thank you very much for it.

In my practice we rarely meet with pertinacity of the ovaries but I feel convinced we do not overlook anything representing a serious and full dispersion of the vagina vessels or accessory openings. The vaginal cervix and portion of the cervical

Believe me,
Yours truly
Herman van Brunt.

me on bimanual palpation
the sensation of the uterus
& ovaries was sometimes compar-
able in size and form
to a small orange.
It was quite freely moveable
in all directions and
we could not identify
the Fallopian tubes.
The vaginal canal
was long and the cervix
patient was a fine
Examples of feminine
physique.
I have given Dr Kempf
Hunter like some
of his private cases on
our profession to see her
for the first time
and if I can influence
patient to do so and
if Dr am agreeable I
Hunter would very much
to send her on.

which disappeared entirely when I opened the cavity full of fluid, was a urachal cyst. That swelling—in other words the cyst—had been the cause of all the patient's recent trouble. As there was no trace of a hæmatometra or hæmatosalpinx I did not feel justified in dissecting in the dark behind the cyst, amidst deformed structures in very uncertain relations to ureters, blood-vessels, &c., merely to make out the extent of arrested development of the uterus and appendages.

It was with the cyst, therefore, alone that I had to deal. I knew of several objections to the draining of a urachal cyst, nor could I dissect away its outer wall, since, as I have just observed, its posterior relations to malformed structures were very uncertain. For these reasons I simply trimmed away as much of the lining membrane as could be safely removed. Then I cautiously passed several fine catgut sutures in the substance of the outer wall and tied them, so that the cyst-cavity was closed in. This outer wall was the muscular sheath of the urachus abnormally thickened, so that the manœuvre just described was easy and nothing was caught up behind the cyst.

I transfixed the segment of the urachus which ran between the lower limits of the cyst and the bladder with a fine linen suture and tied it on both sides. It was then divided between the cyst and the ligature. As will be explained presently, it is fortunate that I transfixed the urachus, instead of tying a single ligature round it as though it were an artery. I kept the portion attached to the cyst for microscopic examination.

Lastly, the sheaths of the recti were united with interrupted fine linen sutures and the integuments closed with interrupted silkworm gut.

After-history.

During convalescence there was no difficulty in micturition, which was voluntary from the first, and no urine leaked through the wound. By August 7 all the silkworm gut sutures were removed; the wound was by then well healed. There was at that date no trace of any swelling in the right iliac region or pelvis. The firm movable body which lay until the operation below the lowest part of the cyst was found, on bimanual palpation, to be connected with the fusiform body to the right of the middle line.

During the summer vacation Dr. Maxwell took charge of the patient in my absence. He reported that up till the day of her discharge at the end of August there was no sign of leakage of urine through the wound nor any show of blood.

On September 12 the patient came to see me at the hospital. Her general condition was good. A slight show of blood had been noted on the previous day, the first indication of a period since the operation. The abdomen was flat and free from tenderness. The cicatrix had completely healed. No trace of any abdominal tumour remained; the right iliac fossa was free; there was no resistant area or gurgling on pressure within its limits. No solid or cystic tumour nor any ill-circumscribed resistant body could be defined in the pelvic cavity. The fusiform body which transmitted menstrual blood and the firm movable body on its left were now definable as one tough, smooth, irregular structure which could be pushed up to the level of the pelvic brim, slipping down immediately the examining finger was withdrawn. The mobility of this structure was very marked. The segment towards the

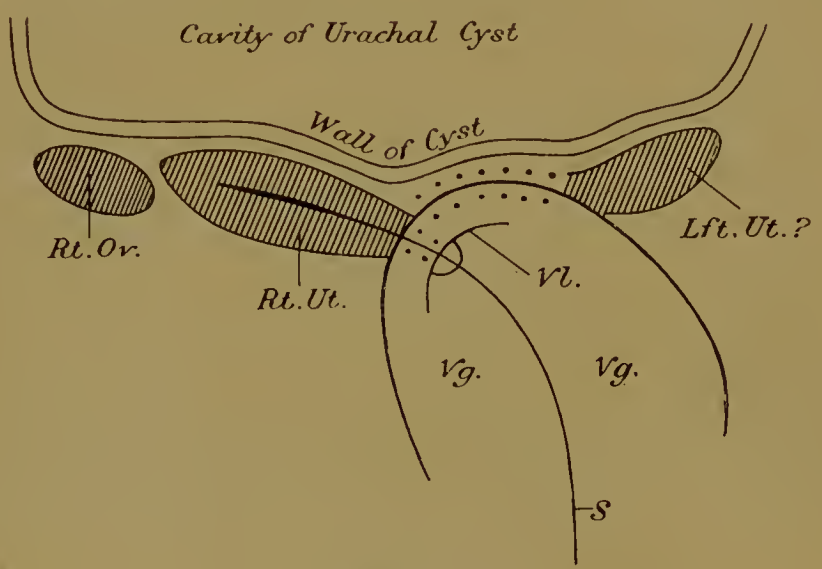

Fig. 1.

Diagram showing the arrested development of the genital tract and the relation of the malformed parts to the cyst of the urachus. *Vg*, vagina, its blind end rising higher on the right side than on the left; *Vl*, valvular fold, through which a sound, *S*, passes into *Rt. ut.*, the right cornu; *Ov.*, right ovary; *Lft. ut.* (?), solid body, probably left cornu, the dotted lines indicate a band, not clearly definable, connecting it with the right cornu.

left was not in the least tender, which would imply that it was the left cornu and not the corresponding ovary. Thus the urachal tumour had disappeared and no hæmatometra had formed, whilst the uterus was represented by a right cornu which communicated with the vagina yet had no cervix, and most probably a left cornu connected with the right by a membranous band (fig. 1).

By the middle of October the patient was in very good health. She had been able to work for nearly four weeks, and a month later she reported herself as quite able to continue at her duties without feeling pain or fatigue.

On December 15, 1908, I once more examined the patient. She was in good health and had menstruated three weeks previously. The local condition was as in September, except that I could distinctly define close to the right cornu the ovary-like body or thickened tissue which I had detected by touch at the operation, and it was tender on pressure like a normal ovary.

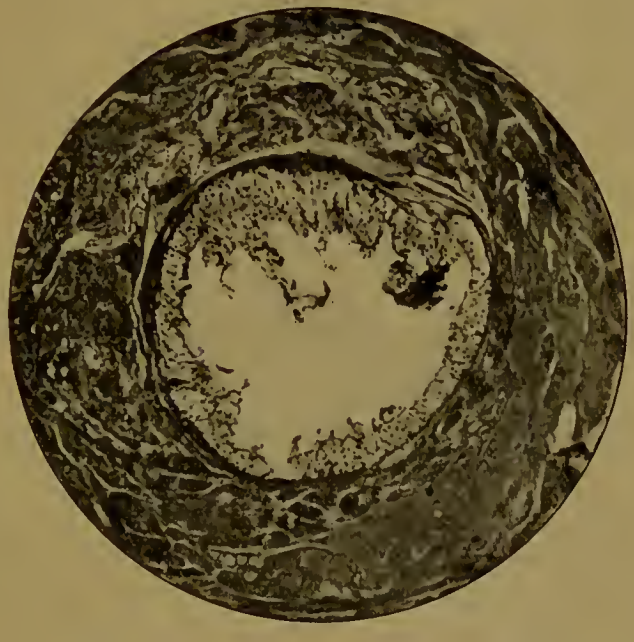

Fig. 2.

Section of the segment of urachus which passed between the bladder and the cyst-wall, as seen under a low power. The canal is quite unobstructed and lined with transitional epithelium ; the muscular coat is very thick.

Microscopical Appearances of the Cord between the Cyst and the Bladder.

A section of the cord-like structure which ran on the surface of the parietal peritoneum between the fundus of the bladder and the cyst was made at the College of Surgeons. There could be no doubt that it was a portion of the urachus. Mr. Shattock reported that the canal was quite patulous and lined with perfect transitional epithelium of the bladder type. The lumen was free from catarrhal or other morbid

products. The muscular coat was abnormally thick, but showed no evidence of inflammation or œdema. Its inner portion was mostly made up of circular and its outer portion of longitudinal fibres; but there was some irregularity in the direction of the fibres in both portions. Some subperitoneal fat was intimately connected with the periphery of the urachus. The appended photomicrograph (fig. 2) shows the above-described appearance of the urachus as seen under the microscope.

The urachal canal, according to Wutz, is well developed in young subjects. In this instance it must have been closed at the bladder end, or, if not, there must have been an efficient Wutz's valve, as the contents of the cyst showed no evidence of being fouled by urine.

Having related this case, the second in my experience, I will now turn to the anatomy of the urachus, dwelling on certain peculiarities of importance in respect to the surgery of urachal cysts.

The Urachus.

The surgical anatomy of the urachus deserves more attention than it has hitherto received in this country. There is no necessity for us to slight the embryologists; indeed, we can take on trust what A. Keith, Ballantyne, Bryce, Cunéo and Viau, and other authorities teach us, being fairly convinced that the urachus is developed from the allantois. There is likewise no need for us to disparage the labours of Bland-Sutton, Byron Robinson, Freer and others who have demonstrated the pathology and surgery of urachal cysts and urachal fistulæ under their own observation. Let us rather turn our attention to a matter intermediate between embryology and pathology — in other words, let us study the anatomy of the urachus as revealed by special investigation of human subjects other than patients suffering from distinct disease of that interesting embryonic relic. Then, perhaps, we shall be better qualified to understand the pathology, diagnosis and treatment of urachal cysts.

Wutz, so often quoted, stands first among writers whom we should follow as an example. In reporting my first case I noted his observations on the histology of the urachus based on seventy-four post-mortem subjects. He found that the epithelial tubular portion grows steadily up to the twenty-fifth year, the canal becoming wider, which is in accord with the appearances displayed by the microscope in the segment of urachus below the cyst in the present case. Passing over histological details, two

important statements deserve to be noted. In twenty-four subjects in Wutz's series there were distinct cystic dilatations of the urachal canal, which contained pus in two instances where the patients had died from septic affections. Of equal importance is Wutz's statement that the vesical orifice of the urachus is guarded by a transverse valvular fold which, under normal conditions, prevents the passage of urine into the urachal canal. In 1898 I expressed my hopes that these researches would be followed up in this country, but up to the present Wutz has found but few imitators. We want to know more about the valve, for instance. Is it constant? The best recent work after the Wutzian method, as I may call it, has been undertaken by Binnie and Clendening in America. I will quote in full their summary: "Mr. Clendening recently examined for me sixteen adult cadavers and seven fœtuses, with the following results: (1) In seven adults and six fœtuses the bladder showed a distinct diverticulum from 1 cm. to 2 cm. deep at the fundus where the urachus is attached. (2) In one adult there was a slight projection instead of a diverticulum. (3) In eight adults and one fœtus the dome of the bladder was smooth. (4) In none of the cases were there found lacunæ lined with epithelium in the urachus. (5) The average adult urachus was 12 cm. long by 1·5 (0·15?) cm. wide. (6) The urachus was usually adherent to the belly-wall, but in one case (diabetic with frequent retention of urine) it was not close to the parietes, but lay between loops of small intestine. (7) In all the cases the urachus was well supplied with vessels."

Binnie adds: "Early in their development the urinary bladder and the urachus are completely surrounded by peritoneum except on their ventral surface, where a meson (mesocyst) [1] exists. This disposition usually disappears and the urachus becomes extraperitoneal. That the mesocyst sometimes persists was well exemplified in an adult cadaver examined for me, in which the urachus did not lie close to the abdominal wall, but lay between loops of small intestine. The persistence of the meson explains the occurrence of some otherwise puzzling intra-abdominal cysts."

This case was the clinical evidence on which clause 6 in the above summary was based. The meso-urachus question is of high importance in respect to urachal cysts, especially those which have attained a large bulk. Delore and Cotte's researches were published almost simultaneouly with the monograph prepared by the two American writers, and, as will

[1] This expression, meaning, of course, mesentery of the bladder, is best discarded, lest it should be taken to signify the mesentery of the urachal cyst.

presently be related, they claim to have detected and removed a true urachal cyst that was intraperitoneal.

The French authorities quote Cunéo and Viau, who have found that in a section of an embryo, 45 mm. in length, the intra-abdominal portion of the allantois and the umbilical arteries are for the greater part completely invested by peritoneum. The disposition persists when the allantois has begun to differentiate itself into urachus above and bladder below. It is, however, transitory, and the urachus becomes, as a rule, extraperitoneal in its entire length.

Professor A. Keith, conservator of the museum of the Royal College of Surgeons, informs me that he has on several occasions detected a very considerable mesentery enfolding the urachus in adult subjects. He adds that under these circumstances the obliterated hypogastric arteries had even deeper and better marked mesenteries. Professor Thane has likewise observed this condition in several adult subjects. In these particular cases there was no evidence, I presume, that the mesentery was acquired, but Professor Keith tells me that he has never chanced to come across a meso-urachus in the new-born infant. Pathological evidence, as I will explain presently, does not lead us to believe that the urachus can acquire a mesentery after fœtal life. Mr. Lockwood reminds me that different observers are not agreed as to where a "fold" ends and a "mesentery" begins, but admits that the urachus may be invested in a fold of parietal peritoneum.

Thus, on the testimony and experience of independent embryologists, anatomists and surgeons, we learn that the urachus may possess a mesentery, or at least a fold of peritoneum, representing most probably the persistence of an embryonic condition. Still, we wish to know more about this matter and about Wutz's valve—so important in respect to the question of the precise relation of a urachal cyst to a cystic fistula connected with the bladder. Therefore it were well if some British teacher of anatomy or pathology would follow the good example of Wutz and of Binnie and Clendening. A series of several hundred subjects investigated after Wutz's method could hardly fail to furnish fresh evidence of high value.

The Urachus and Diverticula of the Fundus of the Bladder.

Although, for reasons given in the introductory remarks at the beginning of this communication, urachal fistula must be dismissed, I may be allowed to say a few words on abnormal prolongations of the

urinary bladder upwards. Garrigues discovered, in a single woman, aged 45, who died after hysterectomy for fibroid, a bladder prolonged nearly to the umbilicus, to which it was connected by a very short urachal tube. Balfour Marshall reports a case where a patent urachus over 1 in. in diameter formed a tubular prolongation of the bladder, and was wounded when an abdominal incision was made for ventro-fixation of the uterus, though without bad consequences. I turned attention to these diverticula in 1898,[1] and have noted Binnie's and Clendening's researches above. The surgeon will hardly trouble to distinguish a diverticulum of the bladder from a patent urachus, even if there be any distinction. What concerns him is the fact that such a structure may be wounded during an abdominal section.

Tait's Pseudo-Allantoic Cysts.

In 1898 I showed how the long series of cases reported by Lawson Tait had been misinterpreted by that great surgeon when he ranked them as urachal cysts, excepting one published by himself and Teichelmann in the *Lancet* twenty years ago. Several writers who have apparently never read my criticisms have recently expressed precisely the same views. Mériel, Binnie, and Delore and Cotte all maintain, as I did, that Tait's series were instances of encysted peritonitis, probably tuberculous, where, as I pointed out, communication between the bladder and peritoneal cavity is not infrequent. I may add that Mr. Tait himself, in a letter about my monograph in 1898, informed me that he had detected mature hair-follicles in sections of the cyst-wall in one case. This would imply that the cyst was a universally adherent ovarian dermoid, or a dermoid tumour derived from some other organ, but urachal it could hardly be.

There were no after-histories to these cases, and no verification of the relations of the cysts at necropsies. Hoffmann's case, where the cyst contained fifty litres of fluid when opened at the post mortem, was shown by Wutz to be an example of chronic hæmorrhagic peritonitis. The original report was so defective that an absurd error about the sex of the patient was included. Yet Delore and Cotte agree with Hoffmann, though rejecting Tait; and in articles on urachal cysts by living writers Tait's series and Hoffmann's equally spurious case are persistently included as though they really represented urachal disease. The error

[1] Loc. cit., p. 307.

seems, like King Charles the Second, a most unconscionable time dying. Let them be henceforth relegated to the archives of chronic peritonitis—in other words, to their proper place.

Cases of Cysts of the Urachus Recently Reported.

Two years ago W. R. Weiser published tables of nearly ninety reported cases of cysts of the urachus. These tables are indispensable for the study of their subject, but they show, as their author admits, that we cannot as yet draw from the literature of urachal cysts any sound conclusions such as may be inferred from published series of the ligature of big arteries for aneurysm, or Wertheim's operation, where at least there was always the aneurysm or the cancerous uterus to begin with. Weiser includes Tait's and Hoffmann's spurious cases and a considerable number of examples of cystic fistula, two being in his own practice.

Weiser's second case seems an authentic instance of a pure urachal cyst. It bore some relation to my own, as it occurred in a young subject (a girl aged 11); it gave rise to an acute attack of abdominal pain, headache, vomiting and fever, and was markedly unsymmetrical. There was impaired resonance between the umbilicus and pubes from the left loin to about 2 in. to the right of the median line. When the abdominal incision was made the parietal peritoneum was found investing the posterior aspect of a large cyst, which was connected inferiorly with a duct running into the bladder, and patulous, let it be noted, to within $\frac{3}{8}$ in. of the vesical cavity. The cyst almost filled the left side of the abdomen below the level of the umbilicus. It contained pus, and had ruptured at one point into the peritoneal cavity. As much of the sac as could be dissected out without tearing through the abdominal wall was taken away, the cavity left behind was washed out and drained with iodoform gauze, and the patient recovered. Let it be noted that before the operation tuberculous peritonitis was suspected.

Whilst Weiser's[1] own case is well reported, as I have stated above,

[1] Weiser has overlooked a case of cystic fistula reported by Unterberger. A woman had a bad fall during the first month of pregnancy. Acute backward displacement of the uterus occurred, the bladder became distended, and at length urine passed entirely through the umbilicus. Rupture of an adherent ovarian cyst was suspected, but a catheter passed into the umbilicus met another introduced through the urethra. The uterus righted itself, and delivery occurred at the fifth month. Unterberger gives a good summary of cases of urachal fistula and cystic fistula.

FROM
C. B. LOCKWOOD
TELEPHONE No.
1000 PADDINGTON.

19, UPPER BERKELEY STREET,
PORTMAN SQUARE. W.

Sept 30 - 08

My dear Dora

I suppose they choose to call a "fold" a "mesa." Anyway. Here we begin and the other ends I cannot be anxious - I suppose. I only remember one sort of weather I cannot find a suitable epithet for - It had no meaning. It had nothing. Whatever they name "fog" in advance

no safe inferences can be drawn from his tables, so judiciously prepared that, among other things, the defective character of many of the reports by other writers is to be seen at a glance. Let us trust that the next writer who takes the trouble to tabulate all recorded cases of urachal dilatation will carefully group under separate headings: (1) fistulæ; (2) primary cystic fistulæ communicating from the first with the bladder or opening at the umbilicus; (3) pure urachal cysts, the subject of this communication; and (4) secondary cystic fistulæ, developed from pure cysts which have acquired communications with the bladder or umbilicus. Surgically and clinically the fourth, as well as the second, must be carefully distinguished from the third. Hence I will pass over all statistics and will now proceed to the consideration of cases of pure urachal cyst published during the last ten years, but not included in Weiser's tables. That writer, I must add, omitted Bryant's two cases which were appended to my monograph in 1898. The first was a pure cyst, in a woman, and simulated an ovarian tumour; the second was a cystic fistula, primary or secondary, and in a male patient.

The recent cases which I will now dwell on were under the observation of surgeons who, like myself, have enjoyed the advantage of studying the experience of others, and were thus the better able to avoid the fallacies which beset the original observer. It happens that these recent cases form a group fairly typical of every variety of pure urachal cyst, sessile on the bladder or separate, extraperitoneal or provided with a mesentery, incipient, moderately developed or large—a most instructive series, in fact. We need not dwell on cystic dilatations detected in fœtal bodies, but as surgeons we must not disregard certain records of the accidental detection of small urachal cysts in the course of operations.

Small Cysts Detected at Operations.

Morestin, a few years ago, operated upon a woman aged 24, removing a suppurating Fallopian tube. When making the abdominal incision he brought to light two cysts too small to be detected by palpation. One lay above the other in juxtaposition but independent, and they occupied the middle line behind the recti and in front of the peritoneum. The urachus could be seen running from the fundus of the bladder into the lower cyst and from the upper cyst to the umbilicus. The cysts did not adhere to the peritoneum behind them. They were tense, smooth, globular and transparent. One was opened, and found to contain a limpid colourless fluid. The outer wall consisted of connective tissue;

the inner was lined with pavement epithelium. Let it be noted that there was no trace of a meso-urachus, nor in either of the cysts which I have described, which were both of moderate size, was the tumour invested with peritoneum except posteriorly. This fact would lead us to believe, as was mentioned above, that a urachal cyst does not make for itself a mesentery as it develops. When a urachal cyst is intraperitoneal the urachus most probably had a mesentery before the cyst existed.

Again, we see that Morestin operated for pyosalpinx, a suppurative condition which was localized. When that condition is more diffused an incipient urachal cyst may be involved, as in two instances recorded by Wutz, to which I have already referred. Hence it is always possible that an abscess in the middle line below the umbilicus may have developed in the urachus. Lastly, Morestin's cysts probably represented an incipient bilocular urachal cyst like that which I described in 1898.

Mériel, of Toulouse, laid open a cyst of the urachus when performing a cystotomy for retention of urine. Its walls were thin, but distinctly thicker towards the bladder,[1] into the fundus of which it was inserted. The cyst had three walls, the outer of connective and fibrous tissue, the middle muscular and the inner thin and smooth.

Lastly, the experience of Opitz is interesting to all who undertake abdominal sections. When performing what he calls a *Relaparotomie*—in other words, when repairing an incisional hernia—he exposed a small cystic body which at first sight appeared to be a displaced and adherent vermiform appendix. On closer examination there could be little doubt that it was a urachal cyst. If so, it would seem that a segment of the urachus where the canal happened to be unobliterated was involved in cicatricial tissue at its upper and lower limits, the canal subsequently undergoing dilatation owing to a collection of fluid and broken-down epithelium in its lumen. The main interest of this case is, however, as in Balfour Marshall's experience already mentioned, the manner in which the vagaries of the urachus and fundus of the bladder may puzzle the operator. Whilst the little cyst in this instance simulated a vermiform appendix the big cyst in my own case gave rise to symptoms indicating appendicular abscess.

Cystic Tumours Removed by Operation.

In 1899 E. D. Ferguson operated on a man aged 47; his original report is very carefully written. The tumour rose to 2 in. above

[1] *Vessie* is misprinted *veine* in the original report.

the umbilicus and extended laterally to the iliac spines. Its surface was flat, resistant on pressure, and felt as though in the abdominal wall, yet malignant disease of the omentum was suspected. The chief symptoms were hypogastric pain and frequent desire to make water. It proved to be a cystic tumour containing over two quarts of a watery fluid, which unfortunately was not examined; it was intimately connected with the wall of the bladder and extended deeply into the pelvis, where the peritoneum lay behind it. Ferguson dissected away the whole lining membrane of the cyst, excepting at the umbilicus, where he found digital processes penetrating the tissues of the abdominal wall. "That portion of the posterior part of the cyst which could be placed in a fold and allow easy approximation of the peritoneum was stitched together and excised." The upper part of the abdominal incision, close to the umbilicus, was drained with gauze, the remaining portion carefully sutured. Six months after the operation the abdominal cicatrix was found to be perfectly sound.

Delore and Cotte's intraperitoneal urachal cyst, to which I have already referred, is reported in their instructive monograph on big cysts of the urachus. The patient was a girl, aged 20, very sickly, and believed to be the subject of tuberculous peritonitis of the ascitic type. There was uniform distension with distinct fluctuation. A large cyst was exposed when the parietal peritoneum was excised. It descended into the pelvic cavity. It contained blood-stained fluid and fibrinous masses, and when it was emptied and drawn through the abdominal incision Delore found that it was connected below with the fundus of the bladder by a short cord which formed an entirely extraperitoneal pedicle and was clearly the lowest portion of the urachus. When the cord was divided the cyst was free of all connexions with the patient's body. The broad ligament and other peritoneal folds near the cyst were normal. The patient made a speedy recovery.

The outer wall of the cyst was the muscular coat of the urachus; the inner wall had been greatly altered and deprived of its epithelium by inflammatory changes. The authors describe minutely how they found on careful dissection that the cyst was invested over the whole of its extent by the peritoneum, and that at the level of the attachment of the cord connecting it with the bladder this fold of serous membrane ceased. A tough cord ran from the pedicle over the anterior surface of the cyst, and was lost in the tissues of the tumour and abdominal wall at the level of the umbilicus. In its middle portion this cord, like the cyst, was completely intraperitoneal.

There can be little doubt that Delore and Cotte's tumour was a cyst

to the edges of the abdominal wound ("marsupialization"); unfortunately the cyst walls, though thick, are not tough like those of the more familiar pelvic and renal cysts. In Routier's case the sutures cut through the tissues, so that the cyst retracted and some of its contents escaped into the peritoneal cavity, with fatal results. In Triepcke and Bier's case it was found after death that enucleation would have been easy. Terrier encountered no difficulty when he enucleated the anterior portion of his cyst, but, suspecting that it was pancreatic, he refrained from completing the process and "marsupialized" the base. The patient recovered, but convalescence was retarded by inflammation of one parotid.

Complete removal by enucleation should always be undertaken if possible. It may be attended with dangerous complications. I have related how Krönlein, in the case reported by Henschen, bravely completed a very difficult operation, but the patient was the subject of pulmonary disease of very long standing, with fatty degeneration of the heart and sclerosis of the coronary arteries, so that the fatal result was not surprising. McCosh's tumour was attached internally to the wall of the aorta. When the connective tissue capsule was incised to allow of enucleation very large vessels were divided. Some lay so deeply that they could not be ligatured; three long artery forceps were applied to them and left on for a time. We are not informed how long after the operation the forceps were removed. The patient recovered. The dangerous proximity of the aorta in McCosh's case reminds us of the observations of Rayer and Marchetti on subjects in the post-mortem room. Both these writers publish drawings of their cysts, which were in the right suprarenal body; they were closely connected with the vena cava.

Pawlik had to deal with a kind of pedicle which ran inwards towards the lumbar vertebræ. It was not secured without much difficulty, and when it was divided, after ligature, a piece of cyst wall as big as a shilling remained on its proximal portion, which receded so far that the operator feared to draw it down in order to excise the fragment. The patient recovered. The after-history of this case and of Terrier and Lecène's, where still more of the cyst wall was left behind, would be of interest.

In my own case enucleation was unattended by any difficulty; I was careful to apply the pressure forceps to all large vessels within sight, avoiding the dangerous practice of pinching tissues in the dark. The surgeon operating on a tumour in the lumbar region is liable to assume that it is renal, and this assumption may induce him to fix a clamp forceps

Gerota's capsule (perirenal fascia) does not completely surround the kidney below, but its two laminæ unite at the upper end of the kidney & send fibres to the under surface of the diaphragm. Some fibres pass between the upper pole of the kidney & the suprarenal body. The connection is loose so that when the kidney is removed the suprarenal body usually remains behind unless disease implicates adjacent.

on a part of the aorta, vena cava, pancreas or intestine when he is under the impression that he is simply securing the renal vessels. Lockwood found no difficulty in enucleating his cyst of doubtful origin, although the small intestine adhered to its wall.

In conclusion, I may observe that the pressure forceps, that invaluable invention of Koeberlé, generalized by Spencer-Wells, must be the sheet-anchor of the surgeon engaged in enucleating a cyst of the suprarenal capsule.

REFERENCES.

Bosanquet. "Cystic Adenoma of Adrenal," *Trans. Path. Soc.*, 1901, lii., p. 64.

Chiari. "Demonstration eines Hæmatoma glandulae suprarenalis dextrae," *Wien. med. Presse*, 1880, p. 1405.

Crawfurd, Raymond. "Cystic Disease of the Suprarenal Gland," *Trans. Path. Soc.*, 1899, l., p. 212.

Henschen. "Ueber Struma suprarenalis cystica hæmorrhagica," *Beitr. zur klin. Chir.*, 1906, xlix., p. 217.

Lockwood. "A Retroperitoneal Cyst, supposed to have originated in remains of the Wolffian Body," *Trans. Path. Soc.*, 1898, xlix., p. 182.

McCosh. "Cysts of the Suprarenal Gland," *Ann. Surg.*, 1906, xlv., p. 878.

Marchetti. "Degenerationscyste der Nebenniere mit compensatorische Hypertrophie," *Virchow's Archiv*, clxxii., p. 472.

Oberndorfer. "Mittheilungen aus dem pathologischen Institut in Genf," Ziegler's *Beitr. zur path. Anat.*, xxix., p. 516.

Ogle. "Cyst with semi-transparent Parietes, occupying about a quarter of one of the Suprarenal Capsules," *Trans. Path. Soc.*, 1865, xvi., p. 252.

Pawlik. "Casuistischer Beiträg zur Diagnose und Therapie der Geschwülste der Nierengegend," *Archiv f. klin. Chir.*, 1896, liii. (Case IV.), p. 582.

Robson, A. W. Mayo. "Three Cases of Removal of the Suprarenal Capsule," *Brit. Med. Journ.*, 1899, ii., p. 1100.

Rolleston. "Adrenal Tumours," Allbutt's "System of Medicine," iv.

Routier. "Kyste hématique volumineux de la capsule surrénale," *Bull. et mém. de la Soc. de Chir.*, 1894, xx., p. 813.

Terrier and Lecène. "Les grands kystes de la capsule surrénale," *Rev. de Chir.*, 1906, xxxiv., p. 321.

Turner, Charlewood. "A Case of Cystic Growths in the Cerebellum and Right Adrenal," *Trans. Path. Soc.*, 1888, xxxix., p. 9.

Cysts of Suprarenal Body

Krecke ("Mitteilungen aus d. Hochschule." Bd 2 no 36 (1904) p 1905) established before a society 4 cases of adenomata of the suprarenal body, all operated on successfully. One case was in good health two years after the operation, though the tumour was found to have invaded the vena cava

Haller "Rein unique absence congénitale du rein droit et de l'artère correspondante". Bulletins et mém. de la Soc. anat. de Paris 1904. p. 304. male 52, died of subacute pulmonary oedema. The left kidney was hypertrophied, but otherwise normal & carried by the suprarenal. The right suprarenal body was normal & lay in its natural position enveloped in fat: there was absolutely no trace of the right kidney or ureter

Movable Kidney & the Suprarenal Body. In 20 7. 1. Tables "Diseases of the Kidney" 4th Ed. Bilateral case. Left kidney and suprarenal body lay in pelvis. So Sir W. Russell case of Pelvic Kidney (Trans Amer. Gyn. Soc. Vol 35 1910 p 39) the suprarenal body was not found out of its normal position

Albert La portion artérielle de la capsule surrénale, ses relations physiologiques et pathologiques avec le cerveau et avec la glande génitale" Presse médicale Oct. 26/1911

Aubertin Tubercule calcifié chez une femme présentant les altérations décrites à organes génitaux externes masculins, accompagné d'une tumeur d'une des capsules surrénales. Etudes sur les tumeurs de l'utérus chez les hermaphrodites et sur les tumeurs des capsules surrénales employées au point de vue chirurgical. Rev. de Gynéc. et de chir. abd. Vol XVIII (April 1912) p 353. (my case quoted) from a Thesis no result (p 375) I send Aubertin a copy July 24/12

H. Temple Russell. "Successful Removal of a Tumour in the Adrenal Gland" Brit. J. S. 1912, p. 179 Tumour now in Hunt. R.C.S.

Morris Sir "Henry. Primary Tumours of the Suprarenal Gland & their Removal by Operation." Brit. J. S. p 1336